

Vermont: A Grid in Transition



SEPA

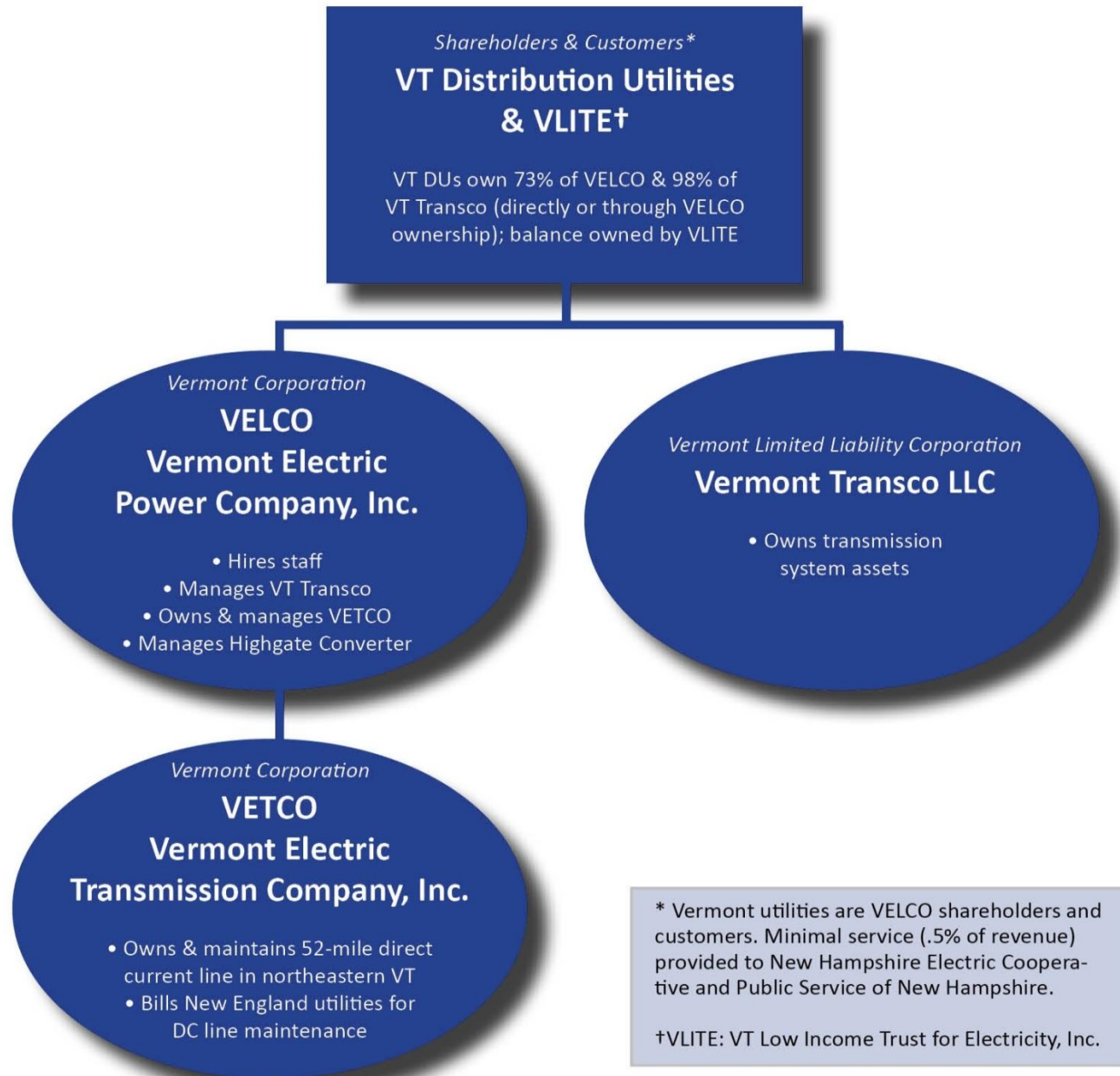
Kerrick Johnson

kjohnson@velco.com

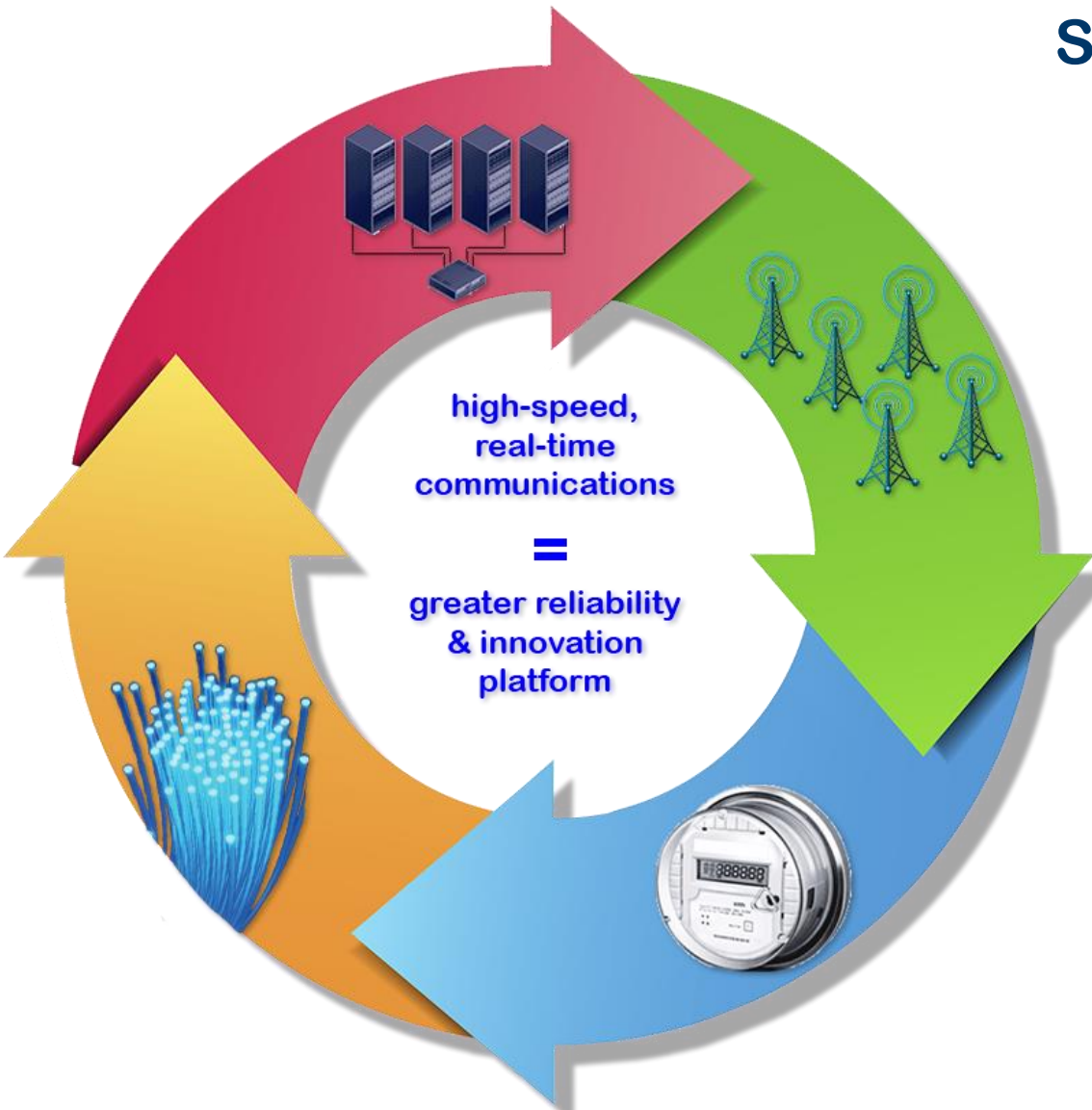
July 27, 2017



Corporate structure: for-profit organized to deliver co-op benefits



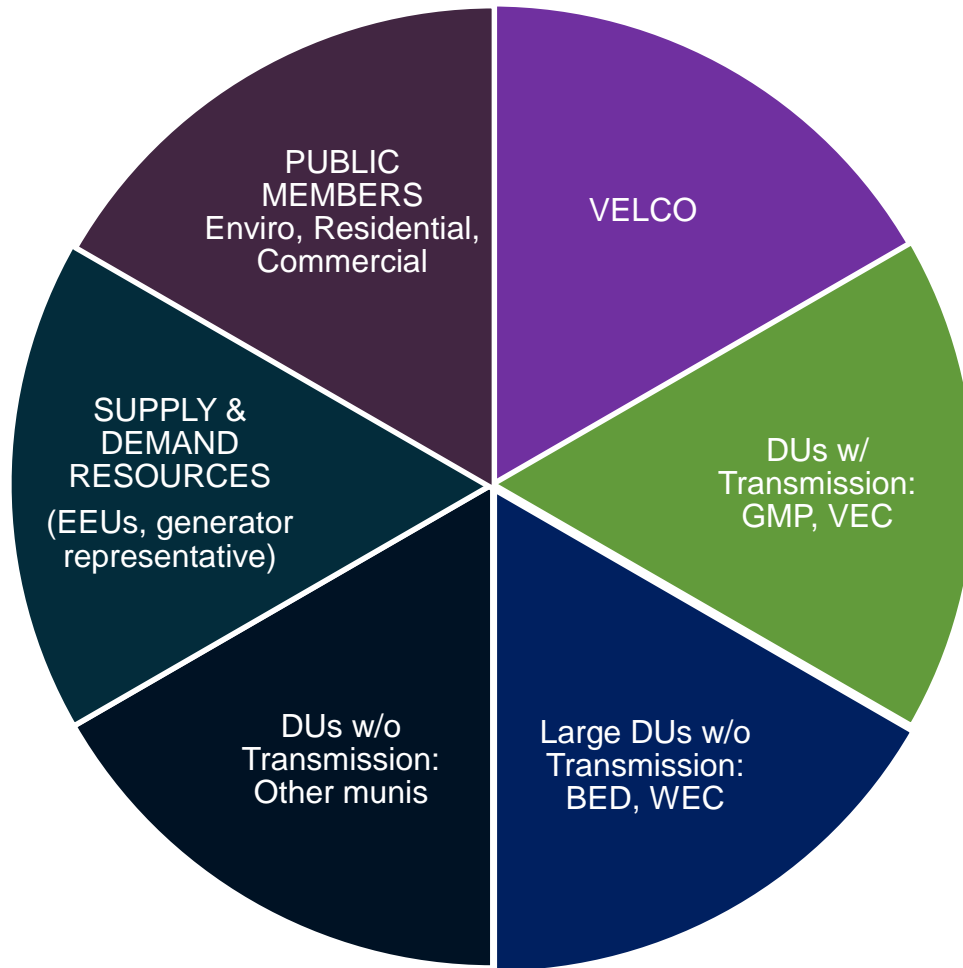
Innovation workbench



Statewide infrastructure

- eEnergy VT smart grid
 - 92-94% smart meters
- Fiber optic network
- Radio system
- High-performance computing cluster—HPCC

Vermont System Planning Committee structure



Six sectors with equally weighted votes

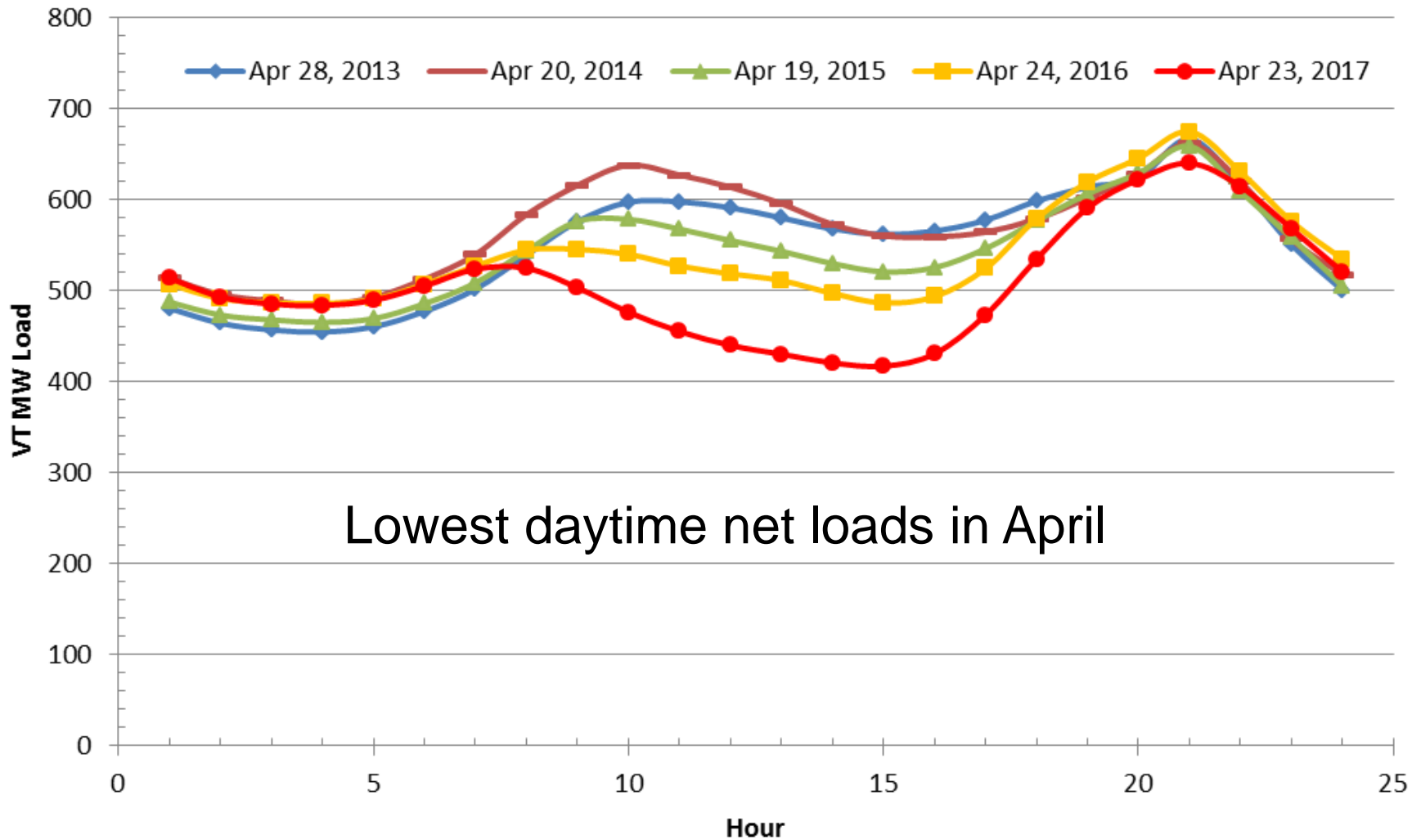
Advisory votes:

- ▶ Affected Utilities
- ▶ Solution selection
- ▶ Cost allocation
- ▶ Implementation strategy

Binding votes: (where utilities disagree)

- ▶ System level (bulk vs sub)
- ▶ Lead utility assignment.

Solar PV impacts in April Vermont Net Loads



Lowest daytime net loads in April

Vermont Weather Analytics Center

A powerful weather, energy data and analytics platform built that utilizes four coupled models and leading-edge analytics to deliver the most precise and accurate wind and solar generation forecasts in the world. VWAC enables us to:



Increase grid reliability, community resiliency



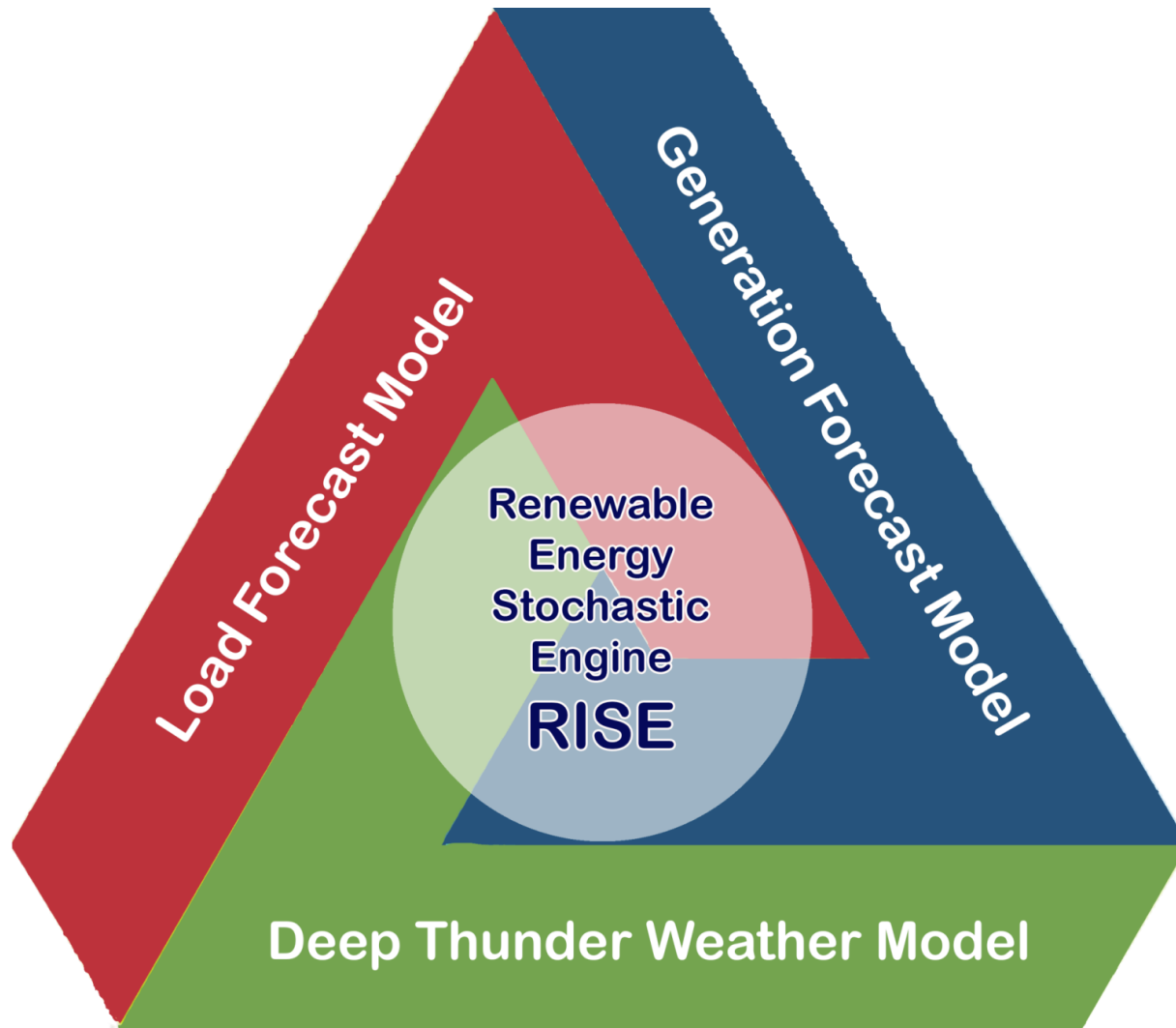
Lower weather event-related operational costs



Garner full value from renewable generation



Vermont Weather Analytics Center





Demonstrated Benefits

Operations

- Improved outage scheduling
- Ability to determine grid capacity for additional solar on the transmission system down to substation level
- Demand analysis capability to substation level
- **Short-term load forecast**
- Contingency Analysis

Planning

- Increased reliability of planning assessments due to AMI data integration
- Improved NTA development
- **Enabling ISO New England to improve day-ahead (over next 6 months)**
- Statewide solar potential map – both total expected energy output and irradiance volatility
- **Storage potential analysis depicts system congestion and approximate size (but not cost) of a scaled storage solution.**

Demand management

- Greater visibility to potential demand response events
- **Increased peak management capability**
- Efficiency measures validation

Joint Venture: Utopus Insights

Asset Analytics



Intelligent and intuitive network-wide asset analytics application

Renewable Forecasting



Accurate hyper-local renewable energy forecasting service

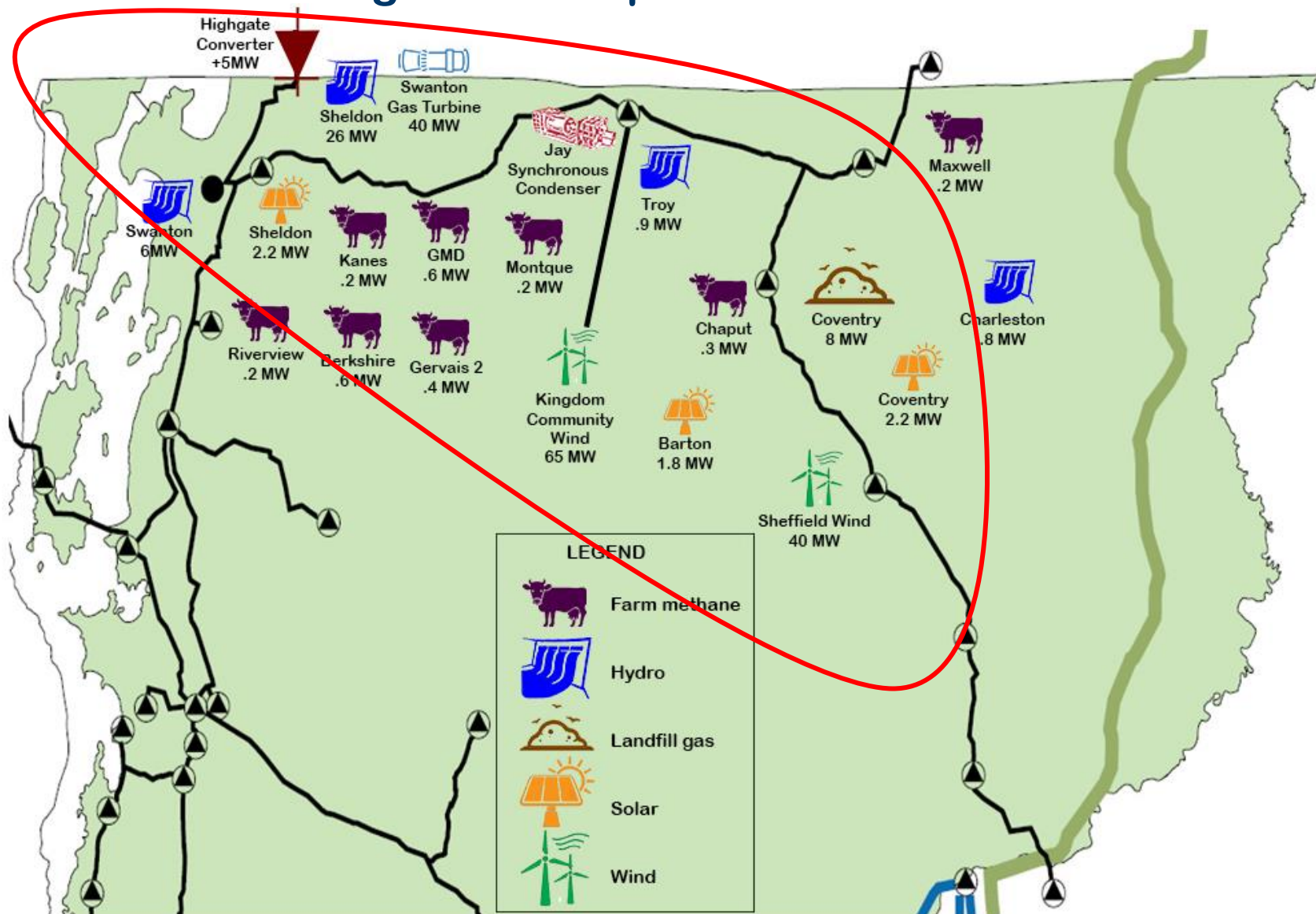
Energy Analytics Platform



The most advanced and extensible hybrid SaaS/On-Premises/IoT energy analytics platform

Current Challenge:

SHEI area: new generation plus solar since 2005

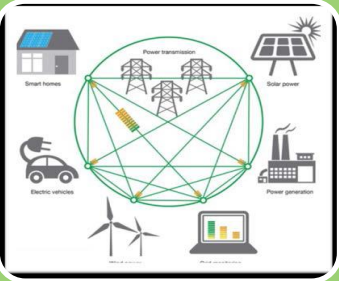


Deliver Value



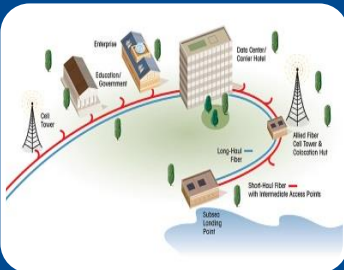
Leverage project management experience

Create and secure opportunities to leverage existing capabilities as provider of project management and other services



Embrace analytics

Comprehensively mine data and apply analytics to generate operational information of value to VELCO, DU customers and other stakeholders



Create greater fiber network value

Identify and secure opportunities to improve system reliability, enable owners to better serve customers and advance state broadband objectives